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UNITS OF WEIGHT AND MEASURE

Definitions and tables of equivalents of the customary weights and measures of the United States and the metric system are included in Miscellaneous Publication M121, released last month.

This compilation supersedes Bureau of Standards Circular C47, issued in 1914, which has been out of print for some time. Necessary corrections have been made and the text revised and rearranged. The new publication contains the table of millimeter-inch equivalents formerly printed as a supplement to C47; the chart showing a graphic comparison of screw-thread pitches, originally published as Miscellaneous Publication M49; and the metric-English equivalents for athletic events which have heretofore appeared as Letter Circular LC376.

The fundamental equivalents and the definitions of the units are clearly set forth, and the difference between units and standards is briefly explained. The

methods adopted for maintaining the standards with the required degree of precision are described.

The tables are arranged for maximum convenience in use, and the paper and type were selected with great care to insure easy reading. An index adds greatly to the utility of the publication.

Copies of M121 are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents each.

REPORT OF THE TWENTY-FIFTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

Miscellaneous Publication M156, which has just been released, is the report of the Twenty-fifth National Conference on Weights and Measures. The Conference, held in Washington on June 4 to 7, 1935, inclusive, was the first since 1931 and the report is therefore of more than ordinary interest in showing developments in the field of

weights and measures during the past 4 years. (See Technical News Bulletins 217 and 219; May and July 1935.)

Besides being of value to all weights and measures officials and manufacturers of weighing and measuring appliances, the report contains a number of papers of general interest. For instance, there is a paper on the methods used by the State of New Jersey in the supervision of the buying of old gold, a house-to-house proposition which has assumed considerable importance during the last 2 years. Federal legislation relative to standard containers and food and drug control are also reported upon, as well as methods for testing beer barrels and the control of "boot-log" coal and gasoline. The latter problem is a most important one in many jurisdictions and has not yet been solved.

As usual, subjects of interest to the automotive industry and to the motorist occupied considerable time at the Conference. The subjects considered included: The effect of changes in temperature on the volume of gasoline in underground storage; gasoline losses in storage and handling; the use of sealed cans in dispensing lubricating oil; and specifications and tolerances for vehicle measuring tanks.

Another matter of considerable interest is the method of undercover buying as an aid to law enforcement. With relation to specifications and tolerances for commercial devices a code was adopted in final form for person-weighing scales and important amendments were made to the codes for liquid-measuring devices and for vehicle tanks, while several other codes relating to scales were amended so as to bring them up to date.

The Supervisor of the Bureau of Weights and Measures of Philadelphia reported upon a unique board of adjustment representing the office of the supervisor, various organized groups in the city, and municipal and State control agencies interested in weights and measures. This board meets once a week and holds hearings on weights and measures violations, applications for licenses, and matters of administrative policies. In the case of violations the board decides whether or not court action shall be instituted. So far, the results have been exceptionally good.

The present officers of the National Conference are: President, Dr. Lyman J. Briggs, Director, National Bureau of Standards; First Vice President, John P. McBride, Director of Standards, Commonwealth of Massachusetts, Bos-

ton, Mass.; Second Vice President, C. D. Baucum, Superintendent of Weights and Measures, State of North Carolina, Raleigh, N. C.; Third Vice President, Martin L. Lang, Commissioner of Weights and Measures, State of Indiana, Indianapolis, Ind.; Fourth Vice President, J. C. Tinkey, Deputy Sealer of Weights and Measures, State of Ohio, Columbus, Ohio; Secretary, F. S. Holbrook, co-chief, Division of Weights and Measures, National Bureau of Standards, Washington, D. C.; Treasurer, George F. Austin, Jr., Supervising Inspector, Bureau of Weights and Measures, Detroit, Mich.

Copies of this publication are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 20 cents each.

A HIGH VERTICAL BROADCAST ANTENNA

RP874 in the April number of the Journal of Research describes experiments made during December 1934, to determine the relative performances of an inverted L antenna and a high vertical-mast antenna in broadcasting from station WBT, Charlotte, N. C. Continuous field-intensity records of emissions from each of these antennas were made at seven different distances varying from 69 to 879 kilometers. Also field-intensity measurements were made at eight points on a circle 1 mile from the transmitting station. The latter measurements indicated that the field intensity at 1 mile was almost doubled by the substitution of the high mast for the inverted L antenna. The field intensity records indicated that the same antenna change increased the field intensity at most of the distant points about one and one-half times, and reduced the amplitude of the fading considerably at the first three receiving points, 69 to 142 kilometers distant.

With either antenna the frequency of the fading was considerably greater at the first three receiving stations than at the more distant ones. This rapid type of fading seemed to be produced largely by interference of ground and sky waves, both being appreciable components of the received fields at the first three receiving stations. The frequency of the fading was not appreciably changed by the substitution of the mast for the L antenna.

During part of this experiment four wires with a spacing of 90° were dropped from crossarms at the top of the mast to increase its top capacity. This arrangement did not appreciably increase the field intensities at 1 mile

or greater distances but decreased the fading at the first three receiving stations.

EVALUATION OF ULTRAVIOLET SOLAR RADIATION OF SHORT WAVE LENGTHS

In RP877 in the April number of the Journal of Research, technical details are given for evaluating the ultraviolet of short wave lengths in solar radiation by two closely agreeing methods: (1) By means of a balanced thermopile and filter radiometer which is calibrated against a standard of thermal radiation; and (2) by means of a titanium photoelectric ultraviolet intensity meter calibrated in absolute value against a standard of ultraviolet radiation.

Both methods of evaluation require a knowledge of the distribution of energy in the ultraviolet spectrum. A method is described for determining the spectral energy distribution in the extreme ultraviolet by means of a titanium photoelectric cell and four filters, thereby eliminating one of the uncertainties in the evaluation of ultraviolet radiation in absolute units.

The intensity of ultraviolet radiation, of wave lengths shorter than and including 3132 Å, in the clearest midsummer midday sunlight, in Washington is about 75 microwatts per cm^2 , decreasing to 0.1 this value (8 microwatts per cm^2) during the clearest midwinter midday sunshine.

Data are given on ultraviolet solar intensities observed in Washington, D. C., San Juan, P. R., and Flagstaff, Ariz.

Extrapolation of the data observed at the three stations (Washington, San Juan, and Flagstaff) indicates an ultraviolet intensity of about 600 microwatts per cm^2 , outside the earth's atmosphere—a fivefold to eightfold increase as compared with a 20 to 30 percent increase in total intensity of all wave lengths.

SIMPLIFIED APPARATUS FOR TECHNICAL SUGAR COLORIMETRY

The sugar technologist in order to meet the demands of commerce and to control properly his processes of manufacture must be able to measure sugar color accurately and to express the results of measurement in terms that have a rational meaning and that may be of practical value when included in the computations involved in the scientific control of sugar manufacture. Until about 1920 the only method of sugar colorimetry was that devised by

Carl Stammer, an eminent German sugar technologist, and described by him in 1860. In the Stammer colorimeter the attempt is made by measurably varying the depth of a sugar solution to match the intensities of the light transmitted by the solution and by a standard composed of a yellow glass plate, daylight or other white light being the source of illumination. Unfortunately the spectral transmission and quality of color of Stammer glasses or of any other yellow glass are never the same as that of sugar solutions, and accurate matching is impossible. Various substitutes for the yellow glasses have been proposed but none of them, for one reason or another, has been found reliable. As a result of investigations at the Bureau, which are described in the April number of the Journal of Research (RP878), a method has been developed for accurately matching these intensities. Instead of employing an incandescent light source giving the entire visible spectrum, an isolated and relatively narrow portion of the spectrum is used in such a way that light of virtually one effective wave length reaches the eye after passage through sugar solution and transmission standard. By choice of the proper wave length the color of the solution may be measured. A simple way of accomplishing this is described in the paper. The comparator is an instrument of standard design illuminated with an incandescent tungsten source from the light of which narrow spectral bands are isolated by means of special filters. Comparison is made with a glass plate calibrated in terms of transmission.

GLOSS CHARACTERISTICS OF SURFACES

In order to study the gloss characteristics of the more glossy surfaces, the Bureau is using a target pattern of concentric rings varying from fine lines to broad bands, which is placed in the open face of a desk lamp. The lines and bands of various sizes in the pattern provide means for studying surfaces of a wide range of "distinctness-of-reflected-image" gloss. Records are made of which lines and bands are visible by reflection from different surfaces, such records serving as permanent gloss values. The dark areas of the target immediately adjacent to the luminous areas provide ideal conditions for the identification of surface "bloom." The best gloss differentiations are made when the lamp is used in a darkened room so that the luminous pattern is the only source of light illuminating the surfaces inspected.

This method, including photographic records of gloss and unusual gloss effects, is discussed in RP879 in the April number of the Journal of Research.

MODEL SCREW PROPELLERS

The operation of a screw propeller in driving a ship may be imitated, on a small scale, by experimenting with a model. If the circumstances in the experiment are so arranged that it is dynamically similar to the full-scale run, the performance of a proposed full-size propeller may be predicted, in advance of construction, from observations on the model.

The conditions which the model experiment must satisfy in order to ensure dynamical similarity are deduced in a paper by Edgar Buckingham which will be published in the Journal of the American Society of Naval Engineers. Some of the practical difficulties in satisfying the conditions, and in interpreting the results of model experiments are discussed, in the light of recently published experimental investigations.

EFFECT OF HYDROGEN PEROXIDE ON WOOL

In practical wool processing such as bleaching, carbonizing, lustering, printing, chlorination and bromination for producing "unshrinkable" finishes, and in natural aging involving the action of light, air, and moisture, wool may become partially oxidized, the extent of the oxidation depending on the severity of the treatments. The quantitative estimation of the oxidation is of great importance, since previous work has shown that this oxidation increases the susceptibility of wool to deterioration by alkaline treatments.

In the April number of the Journal of Research (RP875), an investigation is described, the purpose of which was to provide quantitative data showing the effects of oxidizing agents on wool as a basis for studying all processes in which wool is exposed to oxidation reactions.

Data are presented to show the effect on wool of varying the concentration, temperature, and pH of the hydrogen peroxide solutions, and the duration of treatment. The main point of attack during oxidation is the disulfide group of the cystine in the wool. The extent to which the wool is oxidized bears a functional relationship to the decrease in the cystine content and to the increase in the alkali solubility of the wool.

LEAD ACETATE TEST FOR HYDROGEN PEROXIDE TREATED WOOL

There has been a definite need for a qualitative test for distinguishing between untreated wool and wool bleached with hydrogen peroxide. Tests on the physical properties have been shown to be useless, while dyeing tests are only partially successful, since they were designed to measure damage to wool in general, and lack specificity. The lead acetate test has been used by various workers but the method as outlined is unsatisfactory since it fails in the presence of small amounts of acid and alkali.

In an investigation described in the April number of the Journal of Research (RP876), the degree of darkening of wool by the formation of lead sulfide during treatment with lead acetate solutions of varying pH was studied. It was found that a maximum difference between untreated and bleached wool occurred at pH 5. The results indicate that hydrogen peroxide partially oxidizes the sulfur in wool and prevents the formation of lead sulfide. A mechanism by which lead sulfide is formed in untreated wool is described.

EFFECT OF MINERAL FILLERS ON SERVICEABILITY OF COATING ASPHALTS

Asphalt shingles and roll roofing are made by impregnating felt with a relatively soft asphalt and then surfacing with an asphalt that is considerably harder, the latter being known as a coating asphalt. In recent years the practice has become general to mix finely ground slate, limestone, and similar mineral fillers with the asphalt to obtain a coating which is less affected by sunlight and less subject to plastic flow.

In an investigation recently completed at the Bureau, the weather-resisting properties of a large variety of asphalt-filler mixtures were determined by exposing these mixtures outdoors in various localities and to the accelerated weathering cycle, the latter being an artificial aging test. The tests show that, in general, the durability to weathering of coating asphalt can be considerably improved by the addition of mineral fillers.

AWARD OF WASON MEDAL FOR RESEARCH ON CONCRETE

The Wason Medal for Research was awarded to Commander Ben Moreell, United States Navy, and to Douglas E. Parsons and Ambrose H. Stang of the National Bureau of Standards at the

32d annual dinner of the American Concrete Institute, held at the Palmer House, Chicago, on the evening of February 26. The presentation was made by P. H. Bates, president of the Institute. In this instance, the award consisted of three identical medals, since the work which it recognized was conducted jointly by the Bureau of Yards and Docks of the Navy Department, and the sections of masonry construction and engineering mechanics of the National Bureau of Standards.

This research, considered the most valuable submitted to the Institute during the year 1935, dealt with the so-called Mesnager hinge, a form of flexible joint which permits the articulation of concrete structures, and which was described in Technical News Bulletin 214 (February 1935). The results of this work were published in the Journal of the American Concrete Institute last year. The test specimens were designed by Commander Moreell, who has studied this type of construction in France where it originated, as well as in this country, and the tests were conducted by Messrs. Parsons and Stang in the Bureau's laboratories.

SPECIFIC REFRACTIVITY OF SOME GLASS-FORMING OXIDES

In connection with the Bureau's work on the relations between specific refractivity of glasses and the physical or chemical properties of the constituent oxides, two empirical expressions have been obtained which apparently correlate specific refractivity of the oxides and the ionic radius of the metallic constituent of the oxide. The two expressions are:

$$RW = 2.49 + 1.394r + 2.031r^3$$

$$(RW)^{1/2} = 1.920 + 1.376r^2$$

In the above equations:

R = the specific refractivity, or the refractivity for yellow light, divided by the density of the oxide,

W = the equivalent weight of the oxide based on the combining weight of oxygen as 8,

r = the ionic radius (in angstroms) of the metallic ion of the oxide.

The specific refractivities of the oxides were obtained by extrapolation of available data on specific refractivities (R) of the glasses to that of the pure oxide. The values of specific refractivities of the oxides and Wyckoff's ionic radii (in angstroms) of the metallic constituent of the corresponding oxide are as follows:

Oxide	R	Radii	Oxide	R	Radii
Al_2O_3	0.2082	0.55	MgO	0.2118	0.75
B_2O_3.....	.2392	.20	Na_2O.....	.1936	1.00
BaO.....	.126	1.33	PbO.....	.197	.21
BeO.....	.238	.30	PbO.....	.134	1.18
CaO.....	.2244	1.06	SiO_2.....	.2081	.40
K_2O.....	.2027	1.35	SrO.....	.147	1.18
Li_2O.....	.31	.70			

Using either of the equations and the specific refractivities given above, Wyckoff's values of the ionic radii of the metallic ions can be computed with very good agreement.

If lead is considered as a bivalent atom the above equations do not apply, but they do apply if lead is considered as tetravalent.

CONSISTENCY OF ENAMELS AT FIRING TEMPERATURES

In Technical News Bulletin 223 (November 1935) a description was given of the apparatus used at the Bureau for determining the consistency of molten enamels. It was also stated that opaque covercoat frits, which contain suspended matter in the glassy matrix, act as non-Newtonian fluids (neither viscous nor plastic) at and near the firing temperatures. This fact complicates the numerical reporting of results, both because the apparent viscosity of this type of material varies with the rate of shear, and also because it is to some extent dependent upon the apparatus with which it is measured. The following values of apparent viscosity (which may be subject to some revision) are for the previously described apparatus, the rates of shear being such as to produce a constant torque on the suspension wire, causing a 5° twist. These qualifications are not necessary for the numerical expression of the results on ground coats, since they act as viscous fluids.

Type of sheet-iron enamel	Apparent viscosity in poises at temperatures (° C) of—				
	750	800	850	900	950
"Soft" ground coat.....	26,800	6,200	1,900	600	200
"Hard" ground coat.....	95,600	23,500	6,600	2,300	900
"Regular" cover coat.....	13,200	5,100	2,200	1,100	540
"Very opaque" cover coat.....	69,200	19,700	6,500	2,500	1,160
"Acid resisting" cover coat.....	-----	109,600	26,000	7,700	2,900

It will be noted that there is a large difference in the consistencies of the different enamels. Under the conditions specified above, the acid-resisting cover-coat enamel requires at least 100° C higher temperature than the "ordinary" cover coat, to have the same order of apparent viscosity. The "hard" ground coat requires about 50° C higher temperature than the "soft" one. Also, it will be noted that the relative order of the apparent viscosities of the enamels is different at different temperatures.

LENGTH CHANGES OF REFRACTORY MATERIALS IN TENSION

The Bureau has undertaken a study of creep or length changes of refractory materials at various temperatures over fairly long periods of time. At present, seven commercial brands of refractory bricks ranging in silica content from 15 to 96 percent are undergoing such tests. The specimens used are cylindrical, with a cross-sectional area of about 1.5 square inches. At the beginning of a test at a particular temperature each specimen is placed under a load to produce an initial strain of 0.007 percent. Two gage lengths of 6 inches, diametrically opposite, were used for observing length changes. Fine particles of silicon carbide were cemented to the specimen as marks for the readings. The length changes were observed with a telescopic comparator and measurements were made at monthly intervals. Preliminary results obtained on one set of specimens under test for 228 days at 350° C were as follows:

Specimen number	Silica content	Modulus of elasticity in tension		Change in modulus of elasticity	Increase in length at end of 228 days at 350° C
		Before test	After test at 350° C		
	Percent	1000 lb/in. ²	1000 lb/in. ²	Percent	Percent
1.....	15	4270	4150	(+)	0.008
2.....	48	2220	2210	(+)	.013
3.....	65	1740	1750	(+)	.009
4.....	59	1330	1320	(+)	.005
5.....	57	441	389	-11.8	.007
6.....	96	490	392	-20.0	.053
7.....	81	255	221	-13.3	.012

* Negligible.

Since duplicate readings are good to only ± 0.006 percent, length changes indicated for specimens 1, 3, 4, and 5 might be considered negligible. The

change in modulus of elasticity found after completion of the test was quite definite for specimens 5, 6, and 7, all three of which had a low modulus before the test. The silica brick (96 percent of silica) showed by far the greatest changes both in elasticity and length.

IMPROVED METHOD FOR PREPARING CAST IRON TRANSVERSE-STRENGTH TEST BARS

The transverse-strength test described in Technical News Bulletin 227 (March 1936), is the most common test for cast irons. The load in pounds to break test bars of round or rectangular sections supported freely near the ends and loaded at a mid-point between the supports, is called the transverse strength of the bar under these conditions of supporting and loading. This test is used primarily for stiff or rigid material which will allow only a comparatively small amount of deflection or bending before rupture.

As pointed out in the previous article, preparing cast iron transverse-strength test bars free from "burnt-on" sand and surface defects is important, as such defects seriously impair the transverse-strength results. A pitted or roughened surface on test bars may cause the bar to break under a relatively low load by the so-called "notch effect." A molding material and casting technique which will produce test bars free from such defects is described in RP880 in the April number of the Journal of Research.

Transverse-strength test bars of cast iron, 0.75, 1.2, 1.5, and 2.2 inches diameter, 23 inches long, cast in green-sand molds made of a mixture of 8 parts of an iron molding sand and 1 part of sea coal with the surfaces of the mold cavities faced with carbonaceous nongraphitic material, were found to be superior to bars cast in the ordinary manner. Four methods of molding test bars of various diameters were employed with several types of cast irons. Before casting, the iron was heated to a maximum heating temperature considerably above that at which the metal was poured into the test-bar molds. This temperature was approximately 150° C (270° F) above the liquidus temperature. The test bars were prepared in several different ways, viz, horizontal mold, horizontally inclined mold, top-poured vertical mold, and bottom-poured vertical mold. The bars cast in bottom-poured vertical molds were most uniform in diameter. The transverse strength of

the irons increased with an increase of the maximum heating temperature. A finer primary structure and finer graphite and pearlite constituents were found to be associated with higher transverse strength.

REVISED SIMPLIFIED PRACTICE RECOMMENDATION FOR TAPER ROLLER BEARINGS

Simplified Practice Recommendation R67-36, Taper Roller Bearings, originally was promulgated in December 1927, following consideration and approval of the program at a joint conference of the industry in Detroit, Mich.

In 1924 the roller-bearing industry requested the assistance of the Bureau in establishing a simplified list of bearing sizes. The ball- and roller-bearings division of the Society of Automotive Engineers had already given considerable time and thought to this subject and cooperated in arranging for a preliminary conference of manufacturers and users in June 1925. The conference decided: First, that manufacturers should meet to formulate recommended standards for "current" and "service" lists; second, that the lists should be referred to the SAE for formal approval; and, third, that an effort should be made to secure Nation-wide adoption of the simplified list.

As a result of their survey of current practice, the Society of Automotive Engineers prepared a list of bearing sizes which was to serve: First, as information in the impending edition of the SAE Handbook, and, second, as the basis for a general conference of all interests to meet under the auspices of the Bureau.

At the general conference in February 1927, the program as submitted was approved. It was further decided that every effort should be made to acquaint all interests with the existence of these standards; that suggestions made by the conferees, as well as all other suggestions received as a result of circularization of the recommendation, be referred to the ball- and roller-bearing division of the standards committee of the SAE for its guidance; and that the recommendation be published by the United States Department of Commerce upon receipt of sufficient indication that the standards were generally acceptable. The schedule became effective December 1, 1927.

The recommendation was revised in 1933 to bring it into accord with the changes adopted by the SAE in January 1932, which extended the medium series to 11-inch bore and the heavy

series to 12-inch bore. A table for steep angle taper roller bearings, ranging in size from 0.750-inch to 12-inch bore, intended for naval and general industrial use, was also included. Recently the acting chairman of the standing committee recommended that the dimensions of one bearing in the medium series be changed to conform to the new dimensions for this bearing adopted by the SAE in 1935. This suggestion has met with the approval of the industry generally, and as the printed supply of R 67-33 is exhausted, the minor change referred to has been incorporated in a new edition, and the index number changed to R 67-36. The revised recommendation became effective on January 1, 1936.

Until printed copies are available, mimeographed copies may be obtained without charge from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

The printed issue of the recommendation will contain, in addition to the simplified list of sizes of taper roller bearings, a list of producers, distributors, and users that have accepted the program, and a statement of the benefits which are expected to follow the adoption of simplified practice in industry.

REVISED SIMPLIFIED PRACTICE RECOMMENDATION FOR PHOTOGRAPHIC PAPER

Simplified Practice Recommendation R98-36, Photographic Paper, is a revision of R98-29, bearing the same title. The original recommendation, approved by a general conference of the industry in October 1928 and effective March 15, 1929, established a simplified list of sizes of photo finishing, portrait, and commercial paper, and the width and length of single- and double-weight rolls. It was reaffirmed by the standing committee in May 1930, following a survey among manufacturers of photographic paper, which indicated the degree of adherence to the simplified schedule to be approximately 96 percent, based on production for the year 1929.

In July 1935 the chairman of the standing committee advised that a subcommittee on photographic paper, under the General Code Authority of the NRA, had made some revisions in the listed sizes of photographic paper to meet current demand, and it was deemed advisable to incorporate these changes in a revised edition. These changes comprised the elimination of one size and the addition of five new sizes to the present list of cut sizes.

The revised recommendation became effective February 1, 1936.

This recommendation had its inception in January 1928, when, at the request of manufacturers of photographic paper, the Bureau called a preliminary conference to discuss the practicability of applying the principles of simplified practice to this product. At the meeting, it was the unanimous opinion that there were too many sizes of paper offered and requested, resulting in waste to all concerned, and that a committee should be appointed to secure the facts upon which to base a simplification program. The committee conducted a survey and gathered the data upon which was based a tentative simplified schedule. From this was developed, through a series of meetings of the committee, the final recommendation for the consideration of a general conference of all interests.

At this conference on October 23, 1928, the proposed schedule was considered in detail. The chairman of the simplified practice committee explained that the desire of the manufacturers was to establish a simplified list of cut-and-roll-paper sizes which would properly take care of the normal requirements, as disclosed by the committee's survey based on demand over the year 1926 and to the middle of 1927. He also expressed the belief that the program as a waste-elimination measure was of more than ordinary significance because of the perishable nature of the product.

Until printed copies are available, complimentary copies of this revised simplified practice recommendation, in mimeographed form, may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

The printed edition of the recommendation will contain, in addition to the simplified schedule of sizes of photographic paper, a list of manufacturers, distributors, and consumers who have accepted the program, and a statement of the benefits which are expected to follow the adoption of simplified practice in industry.

TECHNICAL INFORMATION ON BUILDING MATERIALS

There is on file at the Bureau a very large amount of information on the properties and uses of building materials, accumulated as the result of years of research and many thousands of tests.

In order to make this information of greater service to the Federal Govern-

ment and the building industry, the Bureau is starting a series of mimeographed notes entitled "Technical Information on Building Materials." Each of these will consist of only three or four pages giving the important facts on some one aspect of the properties or use of building materials. All nonessentials will be eliminated and the data will be presented in simple language. The following notes have been prepared up to the present time:

TIBM-1. Corrosion of metals used in house construction.

TIBM-2. Life of nonferrous screen wire cloth.

TIBM-3. Thermal insulation: Comparative estimated fuel savings in heating dwelling houses equipped with various means for reducing heat loss.

TIBM-4. Thermal insulation: Insulating values of thermal insulating materials, building materials, and basic wall units.

TIBM-5. Exterior waterproofing for masonry.

TIBM-6. Integral waterproofing for concrete.

TIBM-7. Thermal insulation: Insulating values of an 8-inch solid brick wall with various types of interior finishes.

TIBM-8. Use of calcium chloride as an accelerator for portland cement mortar and concrete.

TIBM-9. Concrete floor treatments.

The supply of these notes is necessarily limited. Their distribution will be confined to Government officials concerned with building projects, and to architects, engineers, and home builders. Requests should make clear the actual need for the information at the time of writing. Letters should be addressed to the Division of Codes and Specifications, National Bureau of Standards, Washington, D. C.

NEW AND REVISED PUBLICATIONS ISSUED DURING MARCH 1936

Journal of Research¹

Journal of Research of the National Bureau of Standards, vol. 16, no. 3, March 1936 (RP868 to RP872, incl.). Price 25 cents. Obtainable by subscription.

¹ Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year; Journal of Research, \$2.50 per year (United States and its possessions, and Canada, Cuba, Mexico, Newfoundland, and the Republic of Panama); other countries, 70 cents and \$3.25, respectively.

Research Papers¹

[Reprints from December 1935 and January 1936 Journal of Research]

RP850. Effect of humidity in hot-wire anemometry. Galen B. Schubauer. Price, 5 cents.

RP857. An absolute determination of the ohm. Harvey L. Curtis, Charles Moon, and C. Matilda Sparks. Price, 25 cents.

Miscellaneous Publications¹

M121. Units of weight and measure (United States customary and metric); Definitions and tables of equivalents. (Supersedes Circular C47.) Price, 15 cents.

Technical News Bulletin¹

Technical News Bulletin 227, March 1936. Price, 5 cents. Obtainable by subscription.

LETTER CIRCULARS

It is the intent of the Bureau to distribute single copies of these Letter Circulars on request only to those parties having special interest in the individual Letter Circular. Economy necessitates limitation in the number of copies issued. It is not the intent to

¹ Send orders for publications under this heading only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 50 cents per year; Journal of Research, \$2.50 per year (United States and its possessions, and Canada, Cuba, Mexico, Newfoundland, and the Republic of Panama); other countries, 70 cents and \$3.25, respectively.

supply parties with a copy of each Letter Circular issued during the month. Letter Circulars are necessarily of a temporary nature designed to answer numerous inquiries on a given subject. Requests should be addressed to the National Bureau of Standards.

C462. Sun lamps, health lamps; carbon and mercury arc lamps. (General information.)

C463. Standard thread for tripods of surveying instruments.

OUTSIDE PUBLICATIONS²

Standards of electromotive force. G. W. Vinal, D. N. Craig, and L. H. Brickwedde. Trans. Electrochem. Soc. (Columbia Univ., New York, N. Y.), 68, 139 (1935).

The Nation's fire loss and preventive measures. S. H. Ingberg. Bldg. Stds. Monthly (Pacific Coast Building Officials Conference, 120 W. Fourth St., Los Angeles, Calif.), 5, no. 1, 6 (January 1936) and 5, no. 2, 3 (February 1936).

Infrared radiation from Otto-cycle engine explosions. Sydney Steel, Armistead Wharton, and C. H. Roeder. Engineering (London, England), 141, 131 (Jan. 31, 1936).

Determination of specific surface of portland cement raw mixtures by means of Wagner turbidimeter. T. Asano. Rock Products (330 South Wells St., Chicago, Ill.), 39, 34 (February 1936).

² These publications are not obtainable from the Government. Requests should be sent direct to the publishers.



